



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/595,791

05/11/2006

Wolfgang Semmlinger

72086

6743

23872 7590 08/13/2008
MCGLEW & TUTTLE, PC
P.O. BOX 9227
SCARBOROUGH STATION
SCARBOROUGH, NY 10510-9227

EXAMINER

PATEL, DEVANG R

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

08/13/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/595,791	Applicant(s) SEMMLINGER ET AL.	
	Examiner DEVANG PATEL	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. **Claims 1-5, 7-11 and 13-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi et al. (US 3954215, of record) in view of Farley et al. (US 3542383, of record).

a. **Regarding claim 1, Takagi et al. ("Takagi")** discloses a friction welding machine (fig. 1) including:

- i. frame 2;
- ii. main platform 3 (i.e. first headstock) with spindle 9 having a workpiece holder 12 and a spindle drive 1;
- iii. feed drive 19 with second workpiece holder 28; and
- iv. another platform 15 (i.e. second headstock) with spindle 24, spindle drive 20; the second headstock is mounted axially movably on frame 2 and is connected to feed drive 19.
- v. Takagi does not disclose at least one of the workpiece holders having a bridge, such that at least one of the workpiece holders does not receive the forge force and the torque produced by friction welding. **Farley et al. ("Farley")** is drawn to chuck (i.e. workpiece holder) assembly for inertia welding machine (inertia welding analogous to friction welding).

Farley discloses the workpiece holder 12 (fig. 1) including a backup support plate 52/52' and the actuator block 40/40' [figs. 2-3]. Support plate 52 and actuator block 40 receive the axial thrust force during friction welding [col. 3, lines 15-17] and are collectively equivalent to a "bridge". Since the torque/forge force is absorbed by 52/40 collectively, spindle 17 does not receive the torque/forge force. Moreover, inner chuck sleeve 37 and outer chuck sleeve 36 receive the additional thrust force, exerting a clamping force on the workpiece wp-1 which prevents the rotation of wp-1 within the chuck and avoids distortion or damage to wp-1 while it is experiencing substantial interactions forces with wp-2 [col. 3, lines 18-30]. It would have been obvious to a person of ordinary skill in the art at the time of the invention to replace the workpiece holder of Takagi (12) with the workpiece holder of Farley (12) because such holder prevents relative rotation of the workpiece within the holder and avoids distortion or damage to the workpiece during friction welding [col. 3, lines 26-30].

b. **As to claim 2**, Takagi discloses that the main platform 3 is fixedly mounted on bed 2 (i.e. stationary; col. 2, line 60).

c. **As to claims 3 & 4**, the apparatus of Takagi is adapted to work with different materials and sizes of the workpieces (col. 5, line 60). Accordingly, the spindles would have to be of different sizes to be compatible with a variety of workpieces. It would have been obvious to a person of ordinary skill in the art to

supply spindles of different sizes in the friction welding machine of Takagi because it provides the flexibility of welding workpieces of different sizes.

d. **As to claim 5**, Takagi discloses that the rotation and moment of inertia of second spindle are controlled in order to adjust the friction welding energy under welding conditions such as material and diameter of workpieces (col. 4, lines 25-60). Since both spindle systems are provided with drive motors, it follows that either spindle drive can have lower load and thus, be weaker than the other. Both spindle systems quickly synchronize with each other, and the variation of sum of the lengths of both workpieces after welding can be reduced to minimum (line 48). It would have been obvious to one skilled in the art to have weaker spindle drive to accommodate varying workpieces and selectively control the process as shown by Takagi because doing so improves the quality of welded workpieces.

e. **As to claim 7**, the workpiece holder of Farley is mounted rigidly in relation to the bridge [fig. 2].

f. **As to claim 8**, Farley discloses the bridge has a carrying body 31 and positive-locking support – capscrew 32/35 for connection to a headstock [fig. 2].

g. **As to claim 9**, capscrew connections 32/35 (equivalent to pins) of Farley embrace openings for engaging carrying body and at least one headstock.

h. **As to claim 10**, Farley discloses removable chuck to permit employment of the chuck assembly with solid workpieces (claim 2). It would have been obvious to a person of ordinary skill in the art to provide detachable workpiece holder in the apparatus of Takagi in order to accommodate various workpieces.

- i. **As to claim 11**, Takagi discloses similar workpiece holders 12 & 28 (fig. 1).
- j. **As to claim 13**, Takagi discloses feed drive 19 mounted and supported at column 18 of frame 2.
- k. **As to claim 14**, Takagi discloses column 18 and stationary headstock 3 connected by tie rod 17.
- l. **As to claim 15**, Takagi discloses the feed drive being a hydraulic cylinder 47 (fig. 6).
- m. **As to claim 16**, Takagi discloses electric drive motor 1.
- n. **As to claims 17-18**, Farley discloses spindle drive having a conventionally known inertial weight 24 (i.e. flywheel; Fig. 1). It would have been obvious to an artisan of ordinary skill at the time of the invention to include flywheel masses on stationary spindle drive because the flywheels store the energy to be consumed at the interface of weld pieces during the friction welding operation.
- o. **Regarding claim 19**, Takagi discloses a method of operating a friction welding machine comprising;
 - vi. providing plurality of spindle heads (3, 15) with spindles (6, 9, 24), spindle drives (1, 19) and workpiece holders (12, 28);
 - vii. feed drive 17 for movably mounted spindle head 15.
 - viii. Takagi does not provide a bridge wherein one of the spindles is relieved of axial forge and welding forces. However, **Farley** discloses such

a “bridge” in the workpiece holder, connected to a headstock as explained in paragraph *a* above [figs. 2-3]. It would have been obvious to a person of ordinary skill in the art at the time of the invention to substitute the workpiece holder of Takagi (12) with the workpiece holder of Farley (12) because such holder prevents relative rotation of the workpiece within the holder and avoids distortion or damage to the workpiece during friction welding [col. 3, lines 26-30].

p. **As to claim 20**, Farley discloses workpiece holder 12 being removable from the spindle 17 [screw connection], and providing a bridge 52/40 with a workpiece holder attached thereto, placed over the spindle and connected to a headstock.

q. **Regarding claim 21, Takagi** discloses a friction welding machine (fig. 1) including:

- ix. frame 2;
- x. first headstock 3 with a first spindle 9 having a workpiece holder 12 and a spindle drive 13 being mounted on the first headstock;
- xi. feed drive 19 with a second workpiece holder 28, wherein a portion of the feed drive is in contact with the frame through support plate [fig. 1];
- xii. a second headstock 15 having a second spindle drive 20 mounted thereto and a second spindle 21, the feed drive extending through the second headstock such that second workpiece holder is located on one side of 15, the second headstock is mounted axially movably on frame 2

xiii. Takagi does not disclose at least one of the workpiece holders having a bridge, such that at least one of the workpiece holders does not receive the forge force and the torque produced by friction welding. **Farley** is drawn to chuck (i.e. workpiece holder) assembly for inertia welding machine. Farley discloses the workpiece holder 12 (fig. 1) including a backup support plate 52/52' and the actuator block 40/40' [figs. 2-3]. Support plate 52 and actuator block 40 receive the axial thrust force during friction welding [col. 3, lines 15-17] and are collectively equivalent of a "bridge". Since the torque/forge force is absorbed by 52/40 collectively, spindle 17 does not receive the torque/forge force. Moreover, inner chuck sleeve 37 and outer chuck sleeve 36 receive the additional thrust force, exerting a clamping force on the workpiece wp-1 which prevents the rotation of wp-1 within the chuck and avoids distortion or damage to wp-1 while it is experiencing substantial interactions forces with wp-2 [col. 3, lines 18-30]. It would have been obvious to a person of ordinary skill in the art at the time of the invention to substitute the workpiece holder of Takagi (12) with the workpiece holder of Farley (12) because such holder prevents relative rotation of the workpiece within the holder and avoids distortion or damage to the workpiece during friction welding [col. 3, lines 26-30].

2. **Claim 12** is rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi et al. in view of Farley et al. as applied to claim 1 above, and further in view of Deemie et al. (US 3439853).

r. Takagi or Farley does not disclose a second headstock having a traveling carriage mounted at frame. However, Deemie et al. (drawn to friction welding apparatus) discloses traveling carrier 72 mounted at frame 78 and connected to second workpiece WP2 (fig. 1). It would have been obvious to an artisan of ordinary skill at the time of the invention to provide screw-driven carrier of Deemie et al. in the apparatus of Takagi because small movements of the carrier, and consequently the headstock can be easily and accurately controlled (col. 4, lines 1-9).

Response to Arguments

3. The amendment and arguments filed 6/13/08 are acknowledged. Applicant's arguments with respect to claims 1 and 19 have been considered but are moot in view of the new ground(s) of rejection. Specifically, applicant's arguments against the Takagi and Gordon references are made in light of the claims as currently amended. The new grounds of rejection set forth above, address these arguments through the instant combination of Takagi et al. and Farley et al., thus rendering them moot. Farley discloses workpiece holder 12 having elements 52/40 which collectively act as a bridge by absorbing the axial thrust [col. 3, lines 15-17], so that spindle 17 is relieved of forge force and torque [figs. 1-2]. It would have been obvious to a person of ordinary skill in the art at the time of the invention to substitute the workpiece holder of Takagi (12) with

Art Unit: 1793

the workpiece holder of Farley (12) because such holder prevents relative rotation of the workpiece within the holder and avoids distortion or damage to the workpiece during friction welding [col. 3, lines 26-30].

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Claims 1-21 are rejected.

The rejections above rely on the references for all the teachings expressed in the text of the references and/or one of ordinary skill in the art would have reasonably understood from the texts. Only specific portions of the texts have been pointed out to emphasize certain aspects of the prior art, however, each reference as a whole should be reviewed in responding to the rejection, since other sections of the same reference and/or various combinations of the cited references may be relied on in future rejections in view of amendments.

Applicant is reminded to specifically point out the support for any amendments made to the disclosure. See 37 C.F.R. 1.121; 37 C.F.R. Part 41.37; and MPEP 714.02.

Art Unit: 1793

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEVANG PATEL whose telephone number is (571)270-3636. The examiner can normally be reached on Monday thru Thursday, 8:00 am to 5:30 pm, EST..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. P./

Examiner, Art Unit 1793

/Jessica L. Ward/

Supervisory Patent Examiner, Art Unit 1793